

INTRODUCTION

Hazard Identification and Risk Analysis (HIRA) is a collective term that encompasses all activities involved in identifying hazards and evaluating risk at facilities, throughout their life cycle, to make certain that risks to employees, the public, or the environment are consistently controlled within the organization's risk tolerance. The three main risk questions are:

- Hazard – What can go wrong?
- Consequences – How bad could it be?
- Likelihood – How often might it happen?

Risk management is the process of minimizing risk to an organization by developing systems to identify and analyze potential hazards to prevent accidents, injuries, and other adverse occurrences, and by attempting to handle events and incidents which do occur in such a manner that their effect and cost are minimized.

According to NABH, hospitals must ensure proactive risk management across the organization. It should include clinical and non-clinical risks .This shall have risk identification, prioritization, risk alleviation .Risk management plan shall be documented risks identification, actions taken to alleviate it should be a part of the plan. There should be a mechanism for informing staff regarding the same. Risk Management plan should be monitored and reviewed for effectiveness at-least annually.

AIM & OBJECTIVE OF THE STUDY

AIM:

The aim of the study was to identify the potential hazards to increase the safety levels of the patient and the healthcare staff through risk assessment in the cathlab department and controls to be taken for effective management of the cathlab as well as to improve the quality of the services to the patients and the healthcare staff.

OBJECTIVE:

- Finding/identifying the potential hazards in Cathlab.
- Assessing the risks that may result from these hazards.
- Quantifying the risk on the basis of likelihood and severity using a risk matrix.
- Determining control measures to eliminate or minimize the level of the risks.
- Monitoring and reviewing the effectiveness of control measures.

METHODOLOGY

Study design:- Observational study (cross-sectional)
Study duration:- 3rd April to 2nd June 2017
Location:- Cathlab department in Asian Hospital, Faridabad
Study Tool:- Risk Matrix
Type of data collected :-

- Primary data collected by visiting the department and by communicating with the staff.
- Secondary data from the various Hospital policies, documents in various departments.

Most of the information was collected through observations. Both types of observations –participative and non participative were used in learning the function and working of various departments.

RISK ASSESSMENT AND RATING						
		LIKELIHOOD / PROBABILITY				
		Frequent (5)	Likely (4)	Occasional (3)	Seldom (2)	Unlikely (1)
SEVERITY	Catastrophic (4)	E (20)	E (16)	H (12)	M (8)	L (4)
	Critical (3)	H (15)	H (12)	M (9)	M (6)	L (3)
	Marginal (2)	H (10)	M (8)	M (6)	L (4)	L (2)
	Negligible (1)	M (5)	L (4)	L (3)	L (2)	L (1)

RISK RATING = Likelihood * Severity

PROBABILITY:

UNLIKELY- Can assume will not occur
SELDOM - Unlikely, but could occur at some time
OCCASIONALLY - Occurs sporadically
LIKELY - Occurs several times
FREQUENT - Occurs often, continuously experienced

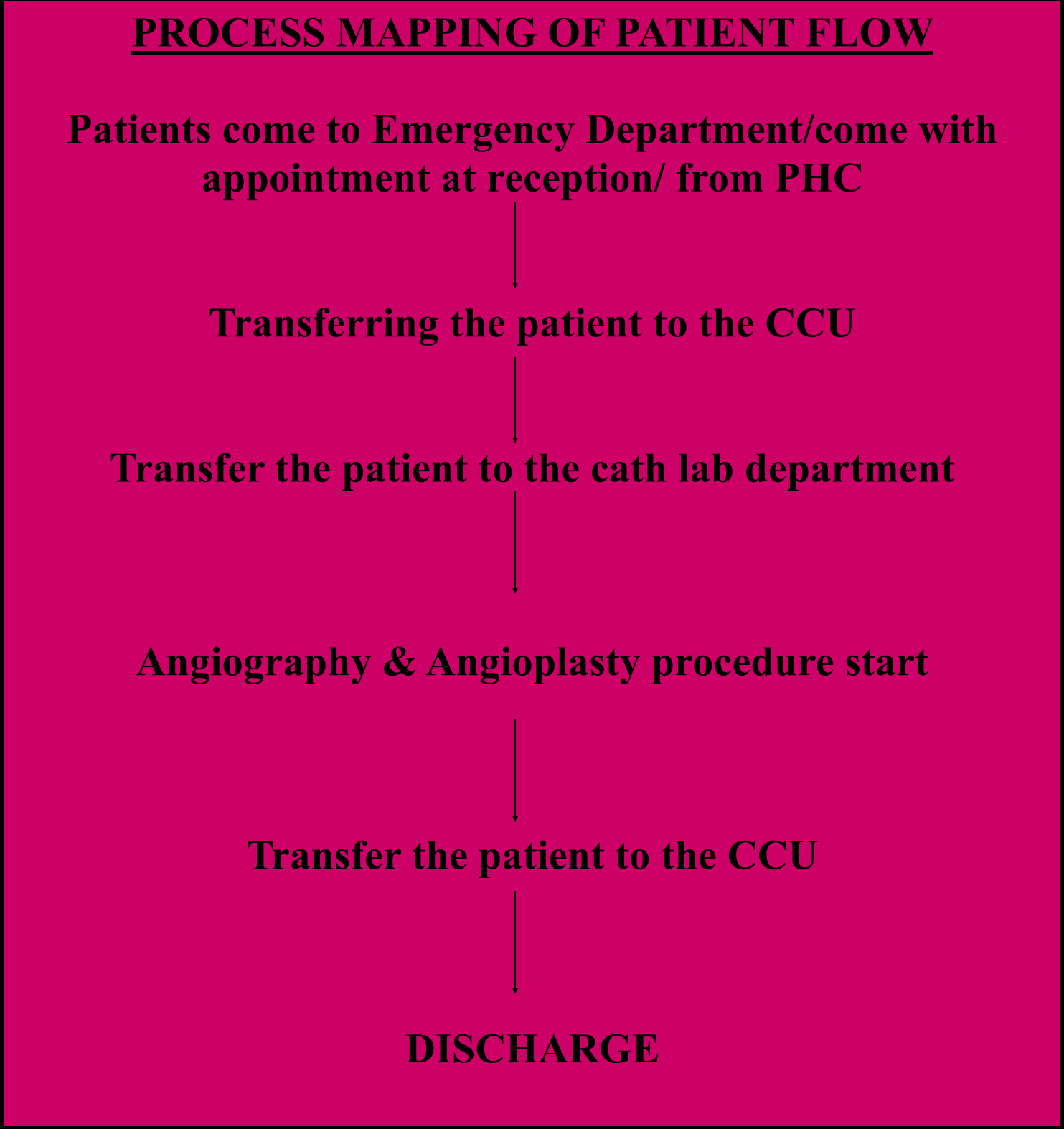
SEVERITY:

NEGLECTIBLE - First aid minor supportive medical treatment, minor system impairment
MARGINAL - Minor injury, lost workday accident, compensable injury or illness, minor property damage
CRITICAL- Permanent partial disability, temporary total disability in excess of 3 months, major system damage, significant property damage.
CATASTROPHIC - Death or permanent total disability, system loss, major property damage.

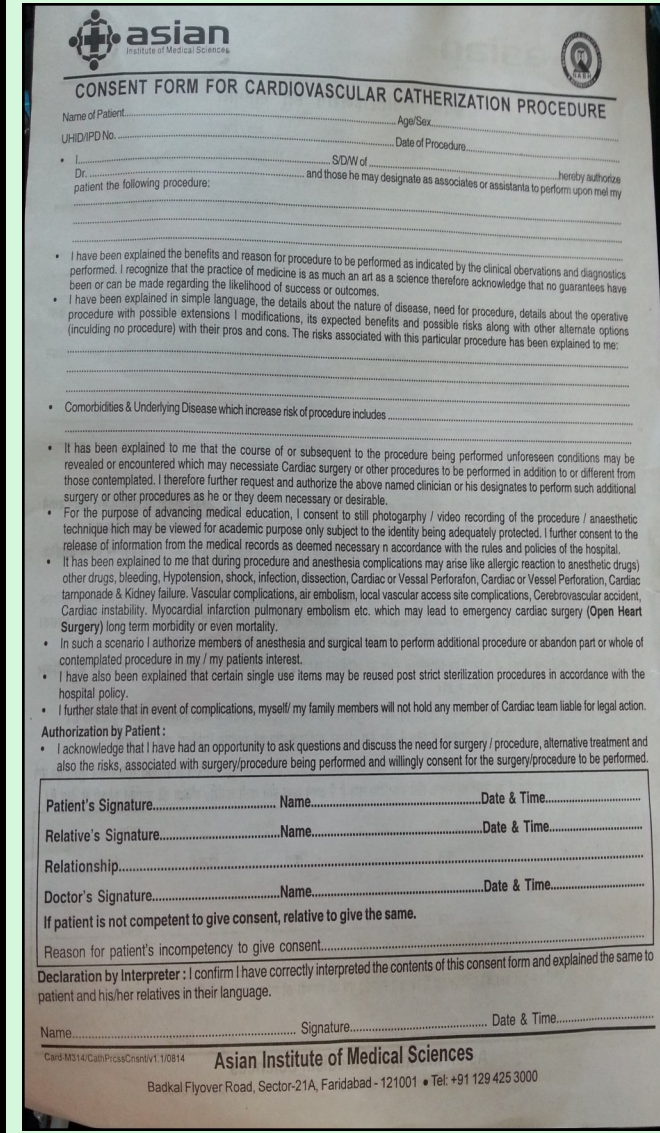
RISK:

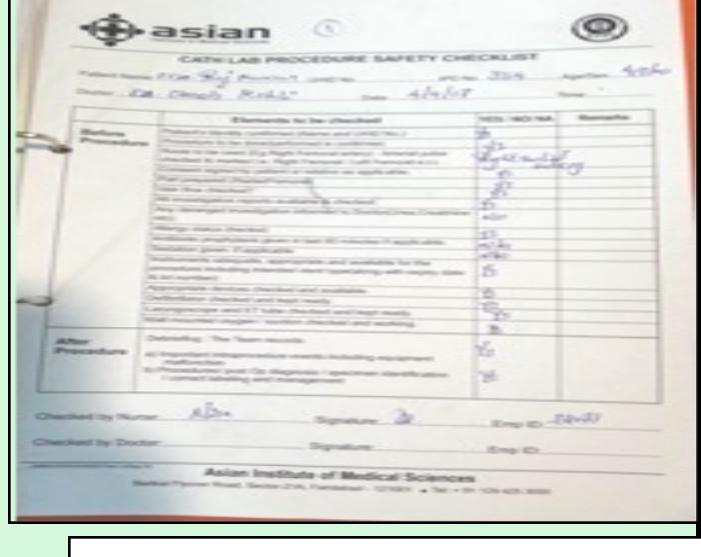
1-5: LOW RISK: Acceptable, no further action needed.
6-10: MODERATE RISK: Adequate, look to improve at next review.
11-15: HIGH RISK: Tolerable, look to reduce risk.
16-20: EXTREMELY HIGH RISK: Unacceptable, stop activity & make immediate improvements.

PROCESS	POTENTIAL RISK	S	P	RS	RR	CONTROLS	SUGGESTIONS
Triaging process	Patient may be wrongly identified according to the triage.	3	2	6	M	Training given to the doctors and nurses regarding patient and triage recognition and priority.	Place the triage flexes at the emergency department gate.
Initial nurse and physician assessment (ER)	1)Delay in assessment.	3	1	3	L	Sufficient staff to be appointed for the particular shifts.	Training given to all nurses for all type of emergency cases and handling the equipment and interpretation the ECG rhythm.
	2)Nurse may not be trained for ACLS, BLS, PALS, NALS, and cases or unable to interpret the ECG rhythm.	4	1	4	L		
Transportation and receiving of patient at CCU &CATH LAB	Risk of fall	4	1	4	L	1) Transported in appropriate method according to patients condition (e.g. trolley, wheelchair). 2) Side rails to be kept in up position during transportation of patient's bed. 3) Safety belt in the wheelchairs/ trolley.	Trolley should be assisted by at least 3 workers.
CCU's doctor assessment	1)Delay in assessment.	3	2	6	M	1) Sufficient staff to be appointed for the particular shifts. 2) Training given to the CCU's doctor for urgent informing to the nearest available cardiologist. 3) Arrange ambulance for picking up the doctors and whole team.	Additional amount to be given to the doctors and whole team on arriving with their own convenience for emergency cases.
	2) Delay in informing and reaching of the cardiologist and whole team at night.	4	2	8	M		
Documentation	1) Incomplete documents like history sheet, requisition form, consent form etc.	3	1	3	L	1) Training given to nursing staff for placing the history sheet in the patient's case file and training given to the doctor's for history reconciliation like (Allergic to or any other treatment or surgical procedure/implant done before the angioplasty). 2) Ask patient to wait for 6 hours or another time is given or postpone the procedure for the next date.	
	2) Patient may not come with fasting or with specific reports (blood/ diabetes) for angioplasty.	2	2	4	L	2) Training given to the doctors for proper sharing of information with the pregnant women.	
	3) Incomplete information sharing with the pregnant women.	3	1	3	L		
Vital parameter checking	Inappropriate checking of vital parameters (Blood pressure, HR, SPO2, ACT) and stabilize the patient.	3	2	6	M	Nurse assessment form is provided and training given to nursing staff for regular filling of the same.	Cath lab doctor's should check nurse assessment form before the procedure.
preparation before procedure	1)Trolley and Equipment's not arranged properly.	3	1	3	L	1)Cath lab Procedure Safety Checklist is provided and is filled before the procedure.	Training given to the CSSD staff for proper sterilization techniques that to be used.
	2) Improper sterilization of single used items.	4	1	4	L	2) Training given to the doctors and the technicians for proper sharing of the information with the patient and the attendant regarding reusing of the items and consent form should be signed for the same.	
	3) Incomplete information given to the patients for reusing.	3	1	3	L		
Use of Lead Aprons	1) Doctors have high rates of orthopedic injury due to heavy weight of leaded personal protective equipment.	4	3	12	H	1) Personnel shielding by wearing lead apron, neck collars etc. Lead sheets.	1) Regular exercise sessions to be arrange for the doctors and whole team.
	2) High risk of cataract as eyes are highly radio sensitive.	4	3	12	H	2) Patient shielding: - shielding of organs e.g. Gonads, thyroid and uterus of the pregnant women.	2) Provide eye glasses to the doctors and whole team to prevent cataract.
	3) Chances of structural changes to the thyroid which include malignant and benign thyroid tumors.	4	3	12	H		
	4) Risk of birth defects and miscarriage for the pregnant women.	4	1	4	L		
Inspection of lead aprons	Cracks in the lead lining can develop at the fold, reducing the useful life of the apron and a risk of getting radiations	4	1	4	L	1) Frequent visual checks to look for obvious tears & cuts. 2) Inspection for cracks in the apron done frequently. 3) Lead aprons are stored properly in hangers/ stand.	Apron checking checklist to be provided and filled on regular basis.
Use of TLD Badge	Excessive radiation exposure to healthcare staff can occurs .	2	4	8	M	TLD badge sent for reading every 3 months.	Keep TLD badge at proper place after utilization.
Cardiac Catheterization	Blood vessel damage and hematomas at the catheter site.	3	2	6	M	1)Sterilization should be done of the catheter. 2)Training given to the staff for proper usage of the catheter and aspirin is given.	
Contrast dye injection	Utricaria,Skin redness etc. can occur to allergic patients.	2	2	4	L	Injection Avil or Injection Effcorlin given.	
Critical patients	Emergency situations like cardiac or respiratory discomfort can occur during the procedure.	3	2	6	M	1) Continuous monitoring through monitors, pulse oxymeter. 2) Crash cart is available.	Cath lab log chart should be provided and filled properly.
Documentation of the Quality Indicator	Wrong data entry	2	2	4	L	Technician to be trained for proper documentation of the quality indicator data.	
Bio-Medical Waste Segregation	Improper Bio-Medical Waste Segregation.	1	2	1	L	Training given to the staff for proper Bio-Medical Waste Segregation.	Bio-Medical Waste Segregation Labels to be placed on the walls along with bins.
Warning signs	Exposure of radiation to others while a procedure is going on within and they accidentally enter the room	3	1	3	L	Appropriate signage's with CAUTION are pasted at the entrance gate.	Red light signal is switch ON when the procedure starts.
Inventory	Shortage of inventory and patient inconvenience	3	2	6	M	Daily inventory done.	Regular update of the inventory given to the purchase department.
Risk Of Equipment Break-down Or Malfunctioning	Software Error	3	3	9	M	1)Validation Of Software Should Be Done. 2)Error documented in error log register.	Report to the BME department within 15 minutes to avoid the hindrance in the procedure.
	Calibration Error	3	3	9	M	Daily/Routine checks by cathlab Personnel to avoid any calibration error.	Calibration sheet should be pasted on the machines for quick reminder.
Health checkup of the employee	Risk to health of the health personnel's	4	2	8	M	Annual health checkups of health care personnel done and is well documented.	Health check up should be done in every 6 months as occupational hazards are high.



PICTURES





CONSENT FORM




CATH LAB PROCEDURE BED

BMW SEGREGATION BINS




LEAD APRONS AND NECK COLLARS




TLD BADGES AND TLD BOX

WARNING SINAGE AT THE ENTRY GATE

CONCLUSION

Hazards risks identification in hospitals is one of the most important works that would help to increase patient safety and therefore increasing patient satisfaction. It will also help in identify, analyze and prioritize all hazards in cathlab department. This case study takes into account for the vulnerabilities of a specific hazard, consequences if a hazard is realized and means to prevent those hazards.

The staffs of the cathlab department are getting trained for proper technique of handling and usage of the equipment to avoid hazards in the department. Equipment's are timely calibrated to avoid failure during procedure. This study illustrated what are the types of hazards that can happen in the department and how to prevent them.

ABBREVIATIONS	
S– SEVERITY	
P– PROBABILITY	
RS- RISK SCORE	
RR– RISK RATING	

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